

## **SECTION 12 30 00**

### **Manufactured Laboratory Casework**

**General:** Materials specified are for clarity of description, are to be used as a standard of comparison and are those of:

SOUTHWEST SOLUTIONS

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## **1. DESCRIPTION OF WORK**

### **1.1 Summary and scope**

- 1.1.1 Furnish and install a modular component system to create work space and storage solutions. Furnish all modular casework, supporting structures, service chases, mobile cabinets, modesty panels, shelving, and miscellaneous items as listed in these specifications or as shown on the drawings, including delivery to the building, setting in place, leveling, scribing to the building as required.
- 1.1.2 Furnish and deliver, packed in boxes, ready for installation by the mechanical contractor, all sinks, drains, and faucets, which occur above the floor, and where these items are part of the equipment or as listed in these specifications, equipment schedules or shown on the drawings. Tailpieces, when required, shall be in accordance with the manufacturer's standards. All fittings shall be furnished less the couplings required to connect them to the supply or waste system.
- 1.1.3 Removal of all debris, dirt and rubbish accumulated as a result of the installation of the furniture in this section to an onsite container provided by others, leaving the premises broom clean and orderly.

### **1.2 Related Divisions**

- Division 5 & 6: Metals, Wood & Plastics
- Division 7: Thermal & Moisture Protection
- Division 9: Finishes
- Division 11: Equipment
- Division 15: Mechanical
- Division 16: Electrical

### **1.3 Related Publications:**

- American Society for Testing Materials (ASTM), ASTM A-366, Standard Specification for Commercial Steel (CS) Sheet, Carbon (0.15 Maximum Percent) cold-rolled, ASTM D1037-91, Test Methods for Evaluating the Properties of Wood-Base Fiber and Particle Panel materials, ASTM E84-94, Test Method for Surface Burning Characteristics of Building Materials, and ASTM D2197-68, Standard Method of Test for Adhesion of Organic Coatings
- National Electrical Manufacturers Association (NEMA), NEMA LD 3.1, High Pressure Decorative Laminate
- NFPA-45 - National Fire Protection Association
- UL- Underwriters Laboratories
- ASTM D552 - Bending Test
- ANSI A208.1; Grade 1-M-3
- NEMA LD 3.0 and ALA 1988
- ASTM B221 - Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wires, Profiles, and Tubes

### **1.4 Alternate Bid Item**

1.4.1 It is the intent of the VAMC to secure bid proposals that will include this section for Manufactured Casework as an alternate bid item and supply all equipment in accordance with this specification. The offering of a product differing in materials and construction from this specification requires written approval and must be obtained seven (7) days before the proposal date. Submit with bid:

- Manufacturer's published catalog with list prices, test results, and load capacities for all products and components included in the bid, including but not limited to manufactured casework components, sinks, and electrical fixtures and fittings.
- Provide to Architect for review all information on proposed furniture system including test data, paint finishes, and design criteria. Provide complete list of any and all deviations taken to this specification. Failure to provide such listing is grounds to disqualify the bid.
- Samples showing Manufacturer can provide modular cabinets in metal, with metal or wood components that are identically sized inside and out.
- Samples showing manufacturer's modular laminate or rigid thermo foil covered doors and drawer fronts mounted on a metal cabinet, using the same hardware inside and out.

- 1.4.2 The Contracting Officer reserves the right to reject qualified or alternate proposals and to award bids based on their judgment, where such action assures the VAMC's best value.
- 1.4.3 Participants in the bid process have the option of clarifying deviations to the specified design, construction, or materials. Without such clarifications, bids will be construed as being in total conformance to the specifications herein.
- 1.4.4 Mock-up: Prior to award of a Manufactured Casework contract, Owner reserves the right to require a bidder to erect a reasonably sized mock-up consisting of the modular casework system components as shown in drawings and specified herein, on the Owner's premises at no additional cost over the bid amount. The mock-up will remain in place up to thirty days after erection is complete. With approval of the mock-up from VAMC / Architect, components used in the mock-up may be used for installation as part of the quoted project.

## **1.5 Quality Assurance**

The modular casework contractor shall also provide work tops, counters and modular accessories such as electrical components and certain plumbing fixtures, all staged at the same geographic location to assure proper staging, shipment and single source responsibility.

## **1.6 Submittals**

- 1.6.1 Submit manufacturer's data and installation instructions for the casework to be provided, and all related items such as sinks, fittings, etc., furnished under this section.
- 1.6.2 Samples from alternate manufacturers will be required and reviewed per specification. Samples shall be delivered, at no cost to the Architect or Owner to a destination set forth by the Architect or Owner. This must be done prior to the submittal of bids. Miniature or "Show Room" type samples are not acceptable. Furnish the following:
- Counter module, including base, work surface, transaction counter, modular electrical fixtures, service chase, and worktop supports.
  - Wall module, including modular chase frame, panels, electrical and worktop support components.
  - Base cabinet, wall cabinet, tall cabinet, mobile cabinet, and an adjustable shelf to include hardware.
  - One sample of all top materials shown or called for, of sufficient size to perform finish requirement tests.

- Samples of all mechanical service fittings, electrical fixtures, locks, door pulls, hinges, and drawer hardware.

1.6.3 Submit shop drawings for casework assemblies showing plans, elevations, isometrics, and cross-sections of casework and service cases, as well as location and type of service fittings. Also:

- Coordinate shop drawings with other work involved.
- Provide roughing-in drawings for mechanical and electrical services when required.

## **1.7 Description**

A modular component system used to create flexible/mobile work space, Counter cases, wall and storage assemblies, including office casework with the following features:

- All case components, including service chase cases shall be available in increments of 3 inches, and all tops shall be available in increments of 1 inch.
- All cabinet bodies shall be constructed of cold-rolled steel or stainless steel.
- All doors and drawer fronts shall be available in laminated panels with edge banded sides, rigid thermo foil with a laminate back in a single neutral color, two-pan construction powder-coated steel, two-panel construction stainless steel with #4 finish, or an aluminum-frame with one of the following inserts: tempered-glass, colored acrylic in a wide variety of colors from manufacturers color palette, or steel panel inserts with stainless steel or painted steel finish.
- All cabinets shall be sized for modular components inside and out and use the same hinges and drawer hardware, regardless of whether they are constructed of laminated edge banded panels, rigid thermo foil panels, steel, or aluminum-frame components.
- All cabinet doors shall have an integrated door catch built-in to the hinge, no additional door catches required to keep doors closed and be self-closing at less than five degrees open.
- All drawers shall be full-extension, self closing, and have a soft closing mechanism that cushions the drawer on closing, actively pulling the drawer closed the last 1½ inch.
- All cabinets shall be able to be disassembled and reassembled, allowing any damaged components such as side panels, bases, back panels, shelves, and such to be replaced using only a drill, rivet gun, and Phillips-head screwdriver.
- All cabinet doors shall be readily removable by means of a snap on clip systems, allowing for easy removal or interchangeability of such doors

using only a flathead screwdriver.

- Drawer fronts shall be removable by means of two touch latches located under the front of the drawer, allowing for removal of drawer fronts without tools in order to replace drawer fronts or to clean/wipe-out drawers.
- All base cabinets shall have removable steel bases that can be exchanged for rolling bases making any case mobile.
- All mobile cases shall have removable bases that can be exchanged for fixed bases making any case fixed.
- All utility chases shall be readily accessible by having removable panels secured, depending on height of panel, by four, six or eight mechanical clips, allowing removal and replacement of access panels by use of a suction cup tool.
- All utility chases shall be able to accept modular wiring as well as hard wired components and plumbing, allowing easy access, installation and removal of electrical and plumbing fixtures.
- All wall assemblies shall be able to accept cantilever brackets allowing the easy attachment and removal of shelves, overhead cabinets and work surfaces. The wall cantilever system shall operate in the same manner as the service chase cantilever mechanism, and shall use the same cantilever components, thus making the adjustment of work surfaces, shelves and cabinets between systems, and adjustments in height in 1 ¼ inch increments possible.
- All modular electrical components may be used in service cases, counter cases, wall components and cabinets, allowing such components to be moved between wall, counter, service case and cabinet components.
- All work surfaces shall be attached by means of mechanical fasteners, allowing cabinets and/ or service cases attached to remain modular and movable.
- Manufacturer's warranty shall be for no less than 5 years after completion and acceptance of the initial installation, and shall include all labor and materials, including on site labor required to remove, replace or repair the products covered. The only exception to this is electrical components and light bulbs, which are covered for one year.
- All components, sub assemblies and individual parts of cabinets and counters can be selectively removed, added, changed, repaired, or repositioned by any manufacturer trained personnel without use of special tools or equipment.
- At Owner's request, Manufacturer shall supply Owner's personnel with

training in the repair, installation and moving of casework system components, allowing Owner's personnel to be certified in such work, thus being able to move, install and repair the casework system while keeping the Manufacturer's warranty intact.

## **1.8 Manufacturers qualifications**

**1.8.1** All casework systems covered by this specification shall be the product of one manufacturer and be staged at one geographic location prior to installation to assure shipping continuity and single-source responsibility.

**1.8.2** Successful bidder may be asked to provide bonding upon request of the Owner and at the expense of the owner.

**1.8.3** All bidders must provide the following prior to bid award:

- Name(s) and short resume of experience of project manager(s) who will manage the project
- Number of project managers in the company.
- List of a minimum of five (5) installations over the last three (3) years of comparable scope
- A detailed quote subtotaled by area showing item numbers and pictures of all components used in the project.

**1.8.4** Successful bidder must show proof of being able to provide owner:

- An AutoCAD® compatible library containing all the system casework components, allowing owner and future architects to draw new projects or reconfigurations. Such library must be able to draw both 2-D shop drawing type symbols as well as isometric 3-D. This library must also contain a pricelist of all manufacturers' products viewable in AutoCAD® and be able to export such pricing to MS Excel®, MSWord® or Adobe Acrobat®.
- Labeling of all material provided showing Manufacturer's part number, owner's PO number and two additional Owner defined fields such as room number of initial installation and Owner's asset tracking number or barcode.
- A catalog of at least 75,000 modular casework components providing casework products specific to labs, pharmacies, nurses' stations, procedure rooms, patient rooms, emergency rooms, operating rooms, nourishment centers, meds storage, nurse/patient servers, lockers and customer service counters.
- List pricing for all components in all finishes and materials in electronic format.

- A guaranteed discount schedule for up to 5 years after the initial installation.

## **1.9 Materials**

### **1.9.1 General Requirements:**

It is the intent of this specification to provide a high quality casework system designed for the Owner's needs, i.e. Counter cases, meds stations, administrative environments and general medical casework that will stand up to the owners needs to effect change as needed and to offer a very high aesthetic appeal to the Owner's employees, associates, patients and customers.

### **1.9.2 Materials:**

Major structural components are made from a combination of high quality powder coated cold-rolled steel, stainless steel, laminated multi-density fiberboard and thermo-foil membrane pressed MDF panels. Sheet steel shall be cold-rolled sheet steel which shall be prime grade; roller leveled, and shall be treated at the mill to be free of scale, ragged edges, deep scratches or other injurious effects. All gauges shall be U.S. Standard. Laminated panels regardless of whether they are used horizontally or vertically shall comply with NEMA LD3 standard for PF42 grade material. Membrane pressed panels shall comply with the requirements contained herein.

## **2. PRODUCTS**

### **2.1 Counter cases, Wall cases, Service chase cases and related product:**

#### **2.1.1 General:**

The Service chase case, the Counter chases case and the Wall case are the primary support structure for the non cabinet portion of the casework system. The Service chase case and the Wall case shall be able to be used in a wide variety of interchangeable configurations including floor to ceiling direct attached installations, against walls (single sided installations), and island configurations. It can also be used as a chase and support structure for electrical and plumbing services, and have the capability to have additional chases added at a later time. The Counter chase case shall support both worksurfaces and countertops, and shall have chases that can accommodate modular electrical fixtures as well as hardwired electrical fixtures and plumbing in multiple chases at a minimum of 18" off the floor. Such chases shall be accessible at any time by having removable panels, "tiles", which can be removed from the exterior and/ or the interior of the station by means of suction cups. The Service chase cases and the Wall cases shall accept cantilever brackets allowing the easy attachment and removal of shelves, overhead cabinets and tops. The wall cantilever system shall operate in the same

manner as the service chase cantilever mechanism, and shall use the same cantilever components, thus allowing the moving of tops, shelves and cabinets between systems possible. The Service chase cases Counter cases and the Wall cases shall accept utility chases at any height and shall be readily accessible by having removable panels held by two, four or eight mechanical clips, allowing removal and replacement of access panels by using only suction cup tools. The Counter cases shall accept all cantilever brackets used for Service chase and Wall case chases as well. Systems that are not adaptable to these configurations will not be acceptable.

#### **2.1.2 Support feet:**

- I.** Support feet shall consist of 14 gauge steel, bead welded for maximum structural strength. Base shall be formed to support a rigid vertical upright assembly of any standard height up to 84 inches.
- II.** Support feet shall be of sufficient length to provide support and prevent tipping of the system. Feet shall not be any longer than the supported worktop, and no less than 8 inches in length.
- III.** Support feet at island configurations shall be a single piece of sufficient length to provide support and prevent tipping of the system. Feet shall not be any longer than the supported worktop on both sides, and no less than 8 inches in length than both worktops back to back.
- IV.** Support feet shall have two (2) floor levelers that provide for a minimum of 1-inch vertical adjustment. Floor levelers of support base, in combination of the floor levelers of the Service chase cases or Wall cases shall be capable of holding maximum total system weight.

#### **2.1.3 Service chase cases**

- I.** Service chase cases shall be constructed of 14 GA formed steel to provide a continuous supported assembly capable of supporting worktop, shelving, and other accessories in either a single or double sided configuration. Side panels of Service chase cases shall have a footprint of no less than 29mm by 4 inches and no more than 29mm by 36 inches and be available in any depth in between up to 108 inches in height.
- II.** The Service chase case shall allow for vertical adjustment of cantilevered countertops and shelves in 32mm increments for the support of normal working weights. Side panels of the Service chase case shall have slots for cantilever brackets, which shall be continuous along the entire height of face and back of the side panels of the Service chase case.
- III.** The inside of the Service chase case side panels shall have continuous holes set back 37mm from the front and back of the panels going up the

entire height in 32mm increments allowing the insertion of aluminum, powder coated steel, stainless steel, laminate multi density or Trespa® shelves with mechanical fasteners and clips as needed, as well as the attachment of doors and drawers as accessories. In addition these holes will allow the placement of mechanical clips for the attachment of power tiles, glazed panels and access panels in a variety of heights to create up to six separate chases individually parametrically scalable in 32mm increments. Portions of or the entire Service chase case must be able to be configured as a storage case whenever needed and wherever it is not partially or completely used for utility chases.

- IV. The inside of the Service chase case side panels shall have an integral channel to conceal plumbing and electrical items within the upright. Channel shall be 1 1/8 inch by 3 inch minimum, scalable up to 1 1/8 inch by 36 inches maximum and any size in 32mm increments in between. Channel shall be covered by a 20 gauge powder coated steel end panel cover. End panel shall be easily removable with the use of a screwdriver. When extra space is required, a channel cover can be used to increase the space available, and shall be able to accommodate electrical receptacles, data, plumbing, and vent lines. Channel cover shall be made from 20-GA steel, painted to match upright.
- V. Preparation for electrical receptacles shall include pre-punched or routed receptacle holes and mounting plates screwed or welded to horizontal members of each chase. All receptacle holes and mounting plates shall be ready to accept the modular wiring system and outlets provided by Manufacturer of the modular casework system specified herein.

#### **2.1.4 Modesty and Access panels:**

Modesty Panels shall be constructed of the same materials as doors and drawer fronts and shall be secured by means of mechanical clips. Modesty or Access panels shall be provided at all locations to cover utility chases, whether behind casework or not. Modesty or Access panels shall not be provided to cover parts of chases used as storage devices.

- a. Provide modesty panels on both sides of islands, unless the chase is used as a pass through or storage device.
- b. Where plumbing or electrical chases are required and penetrations are coming out of slab, floor to countertop Access panels shall be provided.
- c. Where called for, provide two factory cut holes per panel to receive grommets.

#### **2.1.5 Cantilevers for Worksurfaces**

Cantilever Worksurface brackets provide support for the work surface, suspended casework and are adjustable in height from approximately 18

inches to approximately 48 inches nominal height in 32mm increments, depending on the height of the upright. Supports for the worksurface shall be capable of holding a 250lb. per lineal foot minimum load. Cantilevered Worksurface Brackets shall be fabricated from 16 GA tubular steel and a 14 GA formed bracket. The Cantilevered-Worksurface Bracket shall be of sufficient length to support the work surface depth. Brackets shall be available for top depths of 18 inches to 36 inches.

## **2.2 Countertops support**

### **2.2.1 Manually adjustable**

Work surfaces, unless otherwise shown shall be adjustable in height by means of tools. User will be required to loosen no more than 1 screw and be able to adjust worksurface from approx. 18 inches nominal height to approx. 48 inches nominal height in 32mm increments.

### **2.2.2 Electrically Operated Independent Workstations**

- I.** Worksurface where shown, shall be adjustable in height by means of a control pad located underneath worksurface at the front of unit. Electrical height adjustable work surfaces shall be available either as a cantilevered or floor based stationary unit or as a mobile unit.
- II.** Up to 4 DC motors controlled by a single control box shall raise and lower worksurface and shelving mounted to the motorized height adjustable base simultaneously without the use of tools.
- III.** The height adjustable base shall consist of a pair of motorized, three-part telescopic columns with synchronized movement of the middle profile and a range of adjustment of 25-1/2". Columns shall be held together by a footrest and cross stretcher tube. The system will allow table units to be adjusted from a sitting to a standing position, thus allowing people to change their work position easily. The base shall be made of a 1-1/2" x 3" x 11gauge steel tube with a glass filled nylon end plug/caster stem mounted on each end of the tube. Each caster shall be fastened to the base by means of a 5/16-18 socket head machine screw and shall support a minimum of 220 pounds each. The caster housing shall be made of polyamide, have a double ball bearing swivel head, and a polypropylene wheel center with a polyurethane tread 30 mm wide. Each caster shall support 220 pounds. The caster must roll easily over carpet and hard surfaces alike. The three-part telescopic column shall be mechanically fastened to the base. The outer column shall measure 2" x 3-1/8" x 14 gauge and have welded to it a heavy-gauge bracket for mounting of the cross stretcher and will be secured without welding or the use of mechanical fasteners. Intermediate and inner column members shall be the

same gauge as the outer column and shall utilize a ball-guidance system. The motor/control unit shall allow for soft start and stop movement, and shall travel at a maximum speed of 38mm per second. Duty cycle time shall be 10%~6min. per hour or 2 minutes at continuous use at full load. The drive motor/screw must be of low noise level, no greater than 65 decibels as measured from the user position. Low position of top to floor of 26 $\frac{3}{4}$ ". High position to floor shall be 42.5".

- IV. There shall be either 2 columns, one on each end of the table, or 4 columns, one on each corner of the table, depending on the table configurations. The system must have a lift rating of at least 250 pounds per column. The footrest tube shall be 1 inch in diameter x 11 gauge and be chrome plated. Welded in each end of the tube is a threaded disk. The footrest shall be held in place by a mechanical fastener on each side of the base tube.
- V. The control box shall house a compact, high-power toroidal transformer that reduces power consumption to 1.6 Watts in stand-by mode. A 2.5 amp, 120 - 250V fuse shall protect the transformer from overheating. Motor control circuit panel shall have Hall sensors to enable parallel drive of the motors. Duty cycle time shall be 10%~6min. per hour or 2 minutes at continuous use at full load. The control box shall be black plastic. Power rating of the control box is 18 VDC and 3.3 amps. Box size shall be 4.5" wide x 10.9" long x 2.25" deep.
- VI. Work surface height control pad shall allow for infinite increment adjustment of the work surface. Low position of top to floor of 26 $\frac{3}{4}$  inches, and high position to floor shall be 42  $\frac{1}{2}$  inches. Control pad shall have a 3 button memory to allow three different users the ability to pre-program optimum work height.
- VII. A three, single-outlet 15 amp receptacle strip shall be provided for under table plugging in of mobile equipment used on top (such as an electric stapler, printer, computer, radio or task lighting). The strip shall be a 2" x 6" black finished injected molded ABS box and is attached by 2 screws to the bottom of the top, and is equipped with a 4 foot, 3-wire, 14 AWG cord set pre-wired to the control panel.

### **2.3 Countertop Materials**

Counter tops shall be as indicated on the drawings, and all clips, screws and parts for fastening top to table frame and/or cabinet shall be included. Where shown, grommet holes shall be provided in number and size indicated. Worktops shall be independent allowing for individual adjustment of each top by means of cantilevered brackets or floor support panels. Worktops at double sided configurations shall be made as two

separate tops to allow for independent adjustment of height. Countertops shall have finished edges on all sides.

### **2.3.1 Trespa® Countertops and filler panels**

#### **I. Thickness**

Surface 1" (25.4 mm), 3/4" (19 mm), 3/8" (9.5mm) or 5/32" (4mm) as specified and shown in drawings.

#### **II. Grades**

- **Toplab Plus SSC:** Most chemically resistant, electron beam cured surface; Color & Crystal Matte finish (smooth, non-glare) on top side only for bench tops, or
- **Athlon DSC:** Good chemical resistance, better scratch resistance than Toplab; Color & Crystal Mat finish on both sides (smooth, non-glare) for countertops, shelves, backsplashes, pegboards.
- **Color:** Per Trespa® colors currently available for particular grade selected, submit samples, product data and specifications for approval.
- **Quality assurance:** Comply with governing codes and regulations. Provide products of authorized manufacturers and use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions. Components shall have uniform thickness and flatness ("0.03"). Colors shall be consistent for all tops, shelves, pegboards, doors, side panels and other components of like grade and surface texture. Materials shall be Trespa® Toplab Plus and Athlon Material Specification. Provide countertops fabricated of Trespa® supplied by Trespa® North America, 12267 Crosthwaite Circle, Poway, CA, 92064. Phone: 1-800-4-TRESPA® (487-3772).
- **Material Specification:**
  - Modulus of Elasticity, 1.5 Million psi minimum
  - Shear Strength, 2000 psi minimum
  - Compressive Strength, 24000 psi minimum
  - Weight 93 pounds per cubic foot maximum
  - Flammability: Self Extinguishing
  - Water Absorption 3% maximum
  - Use temperature 350F maximum
  - Non-porous surface and edges
  - Will not support fungus or bacteria
  - Uniform load deflection 1/4" maximum per Table A
  - Screw Pull-out Strength Minimum per Table B
  - Chemical Resistance per Table C

#### **III. Chemical Resistance**

Chemical resistance is affected by the type of chemical, its concentration, ambient temperature and humidity, and housekeeping practices; users should test Trespa® in their own environments. Call 1-800-4-Trespa® (487-3772) for samples. Generally with proper housekeeping (spills cleaned immediately) the following chemicals cause no detectable stain, loss of gloss or change in work surface. Toplab's resistance is generally better than Athlon for spills not immediately cleaned up. After 24 hours, the following showed a slight or noticeable stain with Black Toplab: 98% Sulfuric, 65% Nitric, Iodine Crystal and Iodine solution 1%. The rest did not stain or stains could be cleaned leaving a normal surface. Colors may vary in resistance.

Hydrochloric Acid 10,37%	Sulfuric Acid 10, 33, 98%	Nitric Acid 10,30,65%
Nitric/HCL 65%/37%	Chromium Oxide 60%	Phosphoric Acid 85%
Perchloric Acid 70%	Glacial Acetic Acid 99%	Sodium Hydroxide 20%
Ammonium Hydroxide 28%	Silver Nitrate 10%	Ferric Chloride 10%
Potassium Permanganate 10%	Copper Sulfate 10%	Sodium Hypochlorite 13%
Sodium Chloride 10%	Potassium Iodide 10%	Iodine Crystal
Iodine Solution 1N	Formaldehyde 37%	Furfural
Developer (paper)	Developer (negative)	Fixation Bath
Bleaching Bath	Stabilizer B	Acetone
Acetonitrile	Ethyl Alcohol	Ethylene Glycol
Methylethylketone	Methylene Chloride	Ethyl Acetate
Acetic Anhydride	n-Butyl Acetate	n-Hexane 97%
Methyl Alcohol	Methyl Isobutyl Ketone	Tetrahydrofuran
Toluene	Trichlorethylene	Xylene
Acridine Orange 1%	Alizarin Complexone Dihydrate .5%	Aniline Blue water sol. 1%
Basic Fuchsin 1%	Carbol Fuchsin 1%	Carmine .5%
Congo Red 1%	Gentian Violet 1%	Eosin B 1%
Giemsa Stain 1%	Malachite Green Oxalate 1%	Methylene Blue 1%
Methyl Violet 2B 1%	Safranin O 1%	Sudan III 1%
Wright Stain	Cacaobutter	Proteins

## 2.4 Power components

### 2.4.1 General

#### I. Scope

Provide a branch circuit wiring system consisting of factory-assembled,

multi-circuit, multi-port connectors, modular cable assemblies and modular outlet boxes. The system is intended to interface with a building's electrical system and distribute power in a modular, 'plug and play' fashion.

## **II. Classification and use**

The system is designed for indoor, dry locations, has been examined and tested by Underwriters Laboratories Inc. to their standard UL183 and is approved to bear the UL listing mark.

## **III. Submittals**

The following items are the minimum submittal items:

- Product data for all components
- Manufacturers installation instructions
- Shop drawings showing power component layout and complete bill of material

## **IV. Quality**

Material and equipment shall be new and conform to grade, quality, testing and standards specified. Equipment or materials of the same type shall be the products of the uniform design and manufacture throughout. The manufacturer's catalog number specified represents the minimum standard required.

### **2.4.2 Power components**

#### **I. Manufacturer**

The system specified herein shall be provided by the casework manufacturer who is responsible for the integration of the modular wiring system into the casework system.

#### **II. General systems requirements**

- 8-wire, 8-pin configuration with male and female modular connectors.
- Component rating: 20 amperes at 120/208 volts.
- Cable assemblies shall be constructed of UL Listed materials.
- Conductors: #10 or #12 AWG copper wire with 600V, 90° insulation.
- Labeling: Components shall have permanent labels clearly listing manufacturer, catalog number, and CSA/UL Listing. Components starting a branch circuit shall provide a means for indicating electrical panel, circuit number and phasing.

#### **III. Components**

- **Power Feed (PF)**

The PF is a manufactured, multi-circuit, cable that converts the buildings conventional wiring into modular wiring. The PF shall provide an 'open' end (or 'pig-tail') with 12" leads to allow for connection to

the building wiring and one modular multi-circuit connector for connection to the SPIDER MWS. The quantity and location of the PF shall be as required by the contract documents / drawings.

- **Outlet Box (WSCS)**

The WSCS is pre-wired, multi-circuit, outlet box that provides user access to the building's electrical power system and data/communications network. The WSCS shall provide one 12" flexible whip with a modular, multi-circuit connector for power 'IN'. The WSCS shall be constructed of 16-gauge galvanized steel and shall provide single or multiple wiring chambers or compartments to accommodate combinations of both power and signal (audio/visual, communication and data) wiring and devices. The compartments shall be isolated from each other by use of metallic dividers to ensure separation of devices of different voltages and shall provide standard trade size knockouts to facilitate the installation of signal connectors and cables. The WSCS shall provide modular faceplates designed to accommodate a complete line of power, data, communication and A/V connectors and/or modular inserts. The modular faceplates shall be injection molded of PVC and designed to accommodate all major manufacturers' connectivity products. The WSCS shall provide a modular trim or bezel designed to close all gaps and finish the opening created for the installation of the assembly. The WSCS shall be constructed with two mounting brackets allowing a method for securing the WSCS within the users' environments. The WSCS shall be able to be installed assembled with the exception of the modular trim. The quantity, circuiting and location of WSCS shall be as required by the contract documents / drawings.

- **Extender Cable (EXT)**

The EXT is a sealed, multi-circuit cable that allows multiple WSCS's to be connected together. The EXT shall provide a modular, multi-circuit connector on each end. The quantity, length and location of the EXT shall be as required by the contract documents / drawings.

- **Circuit Distributor (CD)**

The CD is a sealed, multi-circuit, multi-port enclosure that converts a single, multi-circuit connector into a multi-port assembly. The CD shall provide four (4) multi-circuit ports for power distribution. When attached to the WSCS, the CD shall allow power to be distributed to multiple WSCS's. The quantity and location of the CD shall be as required by the contract documents / drawings.

### **2.4.3 Under-counter Lighting**

Under-counter lighting shall be provided where indicated. Lighting

shall be plugged into electrical supply to allow for a single point connection of electrical services, yet maintaining modularity. Lights shall be T-8 Rapid Start electronic ballast allowing up to 12 fixtures to be "daisy-chained", and shall have on/off switches. Lighting shall be of sufficient length to be no more than 12" less than the length of the shelf on 48" wide units. 5' and 6' units shall have two 24" lighting assemblies per shelf.

#### **2.4.4 Installation**

The system supplier shall provide installation instructions for system and/or components to the electrical contractor. The contractor shall comply with manufacturer's installation instructions.

### **2.5 Cabinet Cases**

#### **2.5.1 Powder Coated Steel (PC Steel)**

##### **I. Material**

Cabinets and associated components are fabricated from 20 & 14 gauge commercial-grade quality steel per ASTM A-366.

- Cabinets shall be factory assembled utilizing concealed fasteners and hand tools. Construction shall allow all cabinet parts to be replaced and allow inter-case reconfiguration of doors and drawers using hand tools. In addition, cabinet shall be of 32mm design to allow the user a wide range of readily available hardware and accessories.
- Rigid, self-adhesive sound deadening foam shall be provided in all end panels, and optional finished back panels. All bends of the cabinet body parts shall be to the outside thus creating a "clean cabinet interior" (smooth easy to clean interior) as well as access to fully opening doors and full width drawers.
- Fasteners and Anchors: Types, sizes, material and finish as required for conditions of use.
- Welding of cabinet components and/or of hardware will not be permitted, all joints shall be fastened by rivets through panels overlaid whereby each panel has engineered mating holes and whereby a steel rivet passes through the holes and firmly set.
- Cabinet Rivets: 3/16 diameter Steel Rivet with a Steel Mandrel; Finish: Black.
- Cabinet side panels shall have continuous .196" diameter holes set back 37mm from the front and back of the side panels going up the entire height in 32mm increments, allowing for internal shelves and rolling shelves to be height adjusted in 32mm increments. This construction allows for any type of 32mm System, European style hardware to be fitted inside the cabinets.

- Side panels shall be formed from 20 gauge CRS and consist of a series of outwardly spaced vertical bends that form a substantially rigid, integral channel along the front/rear edges, providing a fully planar, inner face that is continuous and uninterrupted between the front and rear edges. Top and bottom edges shall be reinforced with a flanged 14 gauge reinforcement each have an integrally formed, interlock support flange front/rear. Side panel thickness shall be no greater than  $\frac{3}{4}$  inch. All side panels shall be painted prior to assembly and contain a rigid, self-adhesive, sound-deadening foam material.
- Full Top and Bottom panels shall be formed from 20 gauge steel with integral flanges on all sides to  $\frac{3}{4}$  inch thick, with a 1 inch return flanges. The Bottom panel shall have 0.547 inch leveler access holes. Both panels are to be mechanically fastened, flush to the side panels utilizing engineered mating holes and use of a 3/16 diameter steel rivet to provide a rigid enclosure.
- The back panel shall be formed from 20 gauge steel with integral flanges on all sides to  $\frac{3}{4}$  inch thick, with a 1 inch return top/bottom flanges. The back panel shall be mechanically fastened same as the top and bottom panels with engineered mating holes.
- For each cabinet, an individual, removable, fully recessed support base shall be constructed of a 20 & 14 gauge steel and be of modular design. The front/rear/side rails shall be formed into a channel and secured using 3/16 diameter steel rivet. Each corner shall contain the main support and be constructed using 14 gauge steel. Each support base shall have four adjustable levelers, adjustable from the interior of the cabinet up to 1-1/2 inch, mechanically secured to the base by the use of an "AVK"-style fastener. Any cabinet may have a rolling platform with casters instead of a support base. Support bases and rolling platforms shall be interchangeable in the field if desired.
- Adjustable shelves shall be 20 gauge steel - formed  $\frac{3}{4}$  inch down and returned back 1 inch into a channel formation front and rear. The sides shall be formed  $\frac{3}{4}$  inch down on the ends. Shelves to be adjustable on 32mm centers and use a clear polycarbonate, shelf clip. Each shelf clip shall be of institutional-grade and 'lock-in'  $\frac{3}{4}$ " or 1" thick shelves.
- Intermediate rails shall be provided between doors and drawers. Intermediate rails shall be flush with the face of the carcass and designed to allow the use of security panels as required.

## **II. Steel Paint System Finish and Performance Specification**

After the component parts have been completely formed and before finishing, they shall be given a pre-paint treatment to provide excellent

adhesion of the finish system to the steel and to aid in the prevention of corrosion. Physical and chemical cleaning of the steel shall be accomplished by washing with an alkaline cleaner, followed by a spray treatment of a phosphate solution to provide a uniform phosphate surface that shall provide excellent adhesion for the finish and enhance the protection, provided by the finish against humidity and corrosive chemicals. After the phosphate treatment, the steel shall be dried and all steel surfaces shall be coated with a corrosion-resistant, anti-microbial electro-statically applied, powder coat finish that is environmentally friendly. All components shall be individually painted, insuring that no area be vulnerable to corrosion due to lack of paint coverage. The coating shall then be cured by baking at elevated temperatures to provide maximum properties of corrosion and wear resistance. The completed finish system in standard colors shall meet the following performance test requirements:

- Performance test results (chemical spot tests):  
Testing Procedure: Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 1- $\frac{3}{4}$ " diameter watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 2-ounce wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of 77°  $\pm$  3° Fahrenheit. For both methods, leave the reagents on the panel for a period of one hour. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area.

Immediately prior to evaluation, 16 to 24 hours after the reagents are removed; the test surface shall be scrubbed with a damp paper towel and dried with paper towels.

Test evaluation:

Evaluation shall be based on the following rating system.

Level 0 - No detectable change.

Level 1 - Slight change in color or gloss.

Level 2 - Slight surface etching or severe staining.

Level 3 - Pitting, cratering, swelling, or erosion of coating. Obvious

and significant deterioration.

After testing, panel shall show no more than three (3) Level 3 conditions.

Test Reagents:

<u>Test No.</u>	<u>Chemical Reagent</u>	<u>Test Method</u>
1.	acetate, amyl	cotton ball & bottle
2.	acetate, ethyl	cotton ball & bottle
3.	Acetic Acid, 98%	watch glass
4.	acetone	cotton ball & bottle
5.	Acid Dichromate, 5%	watch glass
6.	alcohol, butyl	cotton ball & bottle
7.	alcohol, ethyl	cotton ball & bottle
8.	alcohol, methyl	cotton ball & bottle
9.	Ammonium Hydroxide, 28%	watch glass
10.	benzene	cotton ball & bottle
11.	carbon tetrachloride	cotton ball & bottle
12.	chloroform	cotton ball & bottle
13.	Chromic Acid, 60%	watch glass
14.	Cresol	cotton ball & bottle
15.	Dichlor acetic acid	cotton ball & bottle
16.	Dimethylformamide	cotton ball & bottle
17.	Dioxane	cotton ball & bottle
18.	Ethyl ether	cotton ball & bottle
19.	Formaldehyde, 37%	cotton ball & bottle
20.	Formic Acid, 90%	watch glass
21.	Furfural	cotton ball & bottle
22.	Gasoline	cotton ball & bottle
23.	Hydrochloric Acid, 37%	watch glass
24.	Hydrofluoric Acid, 48%	watch glass
25.	Hydrogen Peroxide, 3%	watch glass
26.	Iodine, Tincture of	watch glass
27.	Methyl ethyl Ketone	cotton ball & bottle
28.	Methylene chloride	cotton ball & bottle
29.	Mono chlorobenzene	cotton ball & bottle
30.	Naphthalene	cotton ball & bottle
31.	Nitric Acid, 20%	watch glass
32.	Nitric Acid, 30%	watch glass
33.	Nitric Acid, 70%	watch glass
34.	Phenol, 90%	cotton ball & bottle
35.	Phosphoric Acid, 85%	watch glass
36.	Silver Nitrate, Saturated	watch glass

37. Sodium Hydroxide, 10%	watch glass
38. Sodium Hydroxide, 20%	watch glass
39. Sodium Hydroxide, 40%	watch glass
40. Sodium Hydroxide, Flake	watch glass
41. Sodium Sulfide, Saturated	watch glass
42. Sulfuric Acid, 33%	watch glass
43. Sulfuric Acid, 77%	watch glass
44. Sulfuric Acid, 96%	watch glass
45. Toluene	cotton ball & bottle
46. Trichloroethylene	cotton ball & bottle
47. Xylene	cotton ball & bottle
48. Zinc Chloride, Saturated	watch glass

\* Where concentrations are indicated, percentages are by weight.

- Performance test results (heat resistance):  
Hot water (190° F - 205° F) shall be allowed to trickle (with a steady stream at a rate not less than 6 ounces per minute) on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.
- Performance test results (impact resistance):  
A one-pound ball (approximately 2" diameter) shall be dropped from a distance of 12 inches onto the finished surface of steel panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close eye-ball examination.
- Performance Test Results (Bending Test):  
An 18 & 14 gauge steel strip, finished as specified, when bent 180° over a ½" diameter mandrel, shall show no peeling or flaking off of the finish.
- Performance test results (adhesion):  
Ninety or more squares of the test sample shall remain coated after the scratch adhesion test. Two sets of eleven parallel lines 1/16" apart shall be cut with a razor blade to intersect at right angle thus forming a grid of 100 squares. The cuts shall be made just deep enough to go through the coating, but not into the substrate. They shall then be brushed lightly with a soft brush. Examine with 100 foot-candles of illumination. Note: This test is based on ASTM D2197-68, "Standard Method of Test for Adhesion of Organic Coatings".
- Performance test results (hardness):

The test sample shall have a hardness of 4-H using the pencil hardness test. Pencils, regardless of their brand are valued in this way: 8-H is the hardest, and next in order of diminishing hardness are 7-H, 6-H, 5-H, 4-H, 3-H, 2-H, F, HB, B (soft), 2-b, 3-b, 4-b, 5-b (which is the softest). The pencils shall be sharpened on emery paper to a wide sharp edge. Pencils of increasing hardness shall be pushed across the paint film in a chisel-like manner until one is found that will cut or scratch the film. The pencil used before that one-that is the hardest pencil that will not rupture the film-is then used to express or designate the hardness.

#### **2.5.2 Stainless Steel**

Not used.

### **2.6 Face Panels** (Doors, drawer fronts, finished ends and support panels):

#### **2.6.1 Powder Coated Steel**

Powder Coated (PC) steel, solid panel assemblies shall be constructed of an inner and outer pan; nominally 0.75 inch thick and shall be fabricated from 20 & 16 gauge commercial-grade quality steel per ASTM A-366. The outer pan shall be formed at all four sides and shall be formed to prevent exposure of sharp edges and corners. The outer door pan shall contain a welded reinforcement member to strengthen the panel and to prevent oil-canning. The inner pan shall be flanged on all four sides and fit inside the outer panel with very tight tolerances to prevent large voids between parts. Powder Coated steel doors shall enter the same powder coat paint finishing process and have the same finish characteristics as the cabinets described in Section 2.5.1. Assembly of the powder coated front assemblies shall contain a self-adhesive, sound-deadening material between the inner/outer pans. All door/drawer panel hardware shall be readily interchangeable as explained in Section 2.8 of this document.

### **2.1 Wall mounted or case mounted adjustable shelving**

Adjustable cantilevered shelving attaches to the Service chase case or Wall case by means of Cantilevered brackets, with height adjustability in 32mm increments and consist of the following:

- Cantilevered shelves are either 16 ga powder coated steel formed down 1 1/8 inch, then returned back and up into a channel formation, or 16 ga stainless steel formed down 1 1/8 inch, then returned back and up into a channel formation. Shelves over 48" long shall be further reinforced with a 20 gauge steel hat channel welded to the underside of the shelf. Shelves may have 3/8 inch Trespa® liners. Shelves may also be Trespa®,

3/4 inch thick (see Tops for Trespa® specifications).

- Shelves are available 9, 12, and 15 inches deep, and are available in widths from 12" to 48" in 3 inch increments. Reference drawings for exact depth and width.
- Steel lips made of 16 GA powder coated steel , stainless steel or Aluminum are fastened to the bottom of the shelf with screws, shall protrude above shelf at least 1/2 inch and are available for the front and/or back of the shelf. Provide lips as indicated on drawing.
- Shelves shall have a 250 lb. weight capacity and be capable of being mounted flat or adjusted at angles from plus 15° to minus 45° in 15° increments.

## **2.8 Hardware**

**I. Pulls:** Provide 160 mm pulls from manufacturer's standard selection, as specified by architect in plans and specs. Color: [nickel] or [black].

**II. Hinges:** Häfele Aximat 300, nickel coated zinc alloy, with lifetime warranty. Color: [Nickel] or [Black]. Exposed, self-closing, panel overlay, open to 270° maximum; providing a reveal to match standard cabinet reveal of 4mm. Provide two (2) hinges per door minimum on sizes up to 48 inches high, and three (3) hinges per door on sizes up to 96 inches high. Fasten hinges to door using #8 x ½" Type AB Crossed Recessed Undercut Flat Head Tapping Screw, or 18-8 Stainless Steel (depending upon door material) - to side panels with mounting plate using #8 x ½ Type AB Crossed Recessed Undercut Flat Head and #8 x ½ Type AB Crossed Recessed Flat Head Tapping Screw, 18-8 Stainless Steel.

### **III. Drawers:**

Shall be self closing and have a soft closing mechanism that cushions the drawer on closing and actively pulls the drawer closed the last 1½ inch.

Drawers shall have:

- Sides constructed of powder coated 16 GA steel with up-turned edge to permit attachment to drawer bottom. Baked-on powder coated finish; color: silver
- Fabricate drawer bottom/back from 20 gauge steel, forming a 5/8 inch thick bottom and a 5/8 inch thick back panel. Baked-on powder coated finish; color: Nickel (anti-microbial)
- 125 pound capacity under mounted drawer slide system; drawer slide forms drawer side, full extension.
- Dynamic load capacity, 24 inches deep drawers, 100 pounds, static load capacity 125 pounds.

- Dynamic load capacity, 24 inches deep file drawers, 150 pounds, static load capacity 200 pounds.
- Permanently lubricated ball bearing full extension slides.
- All drawers shall be full extension, self closing and have a soft closing mechanism that cushions the drawer on closing and actively pulls the drawer closed the last 1½ inch.
- File drawers shall be readily convertible by Owner from side to side to front to back filing and shall also be able to be changed by Owner from letter to legal filing.
- Drawer fronts shall be removable by means of two touch latches located under the front of the drawer, allowing for removal of drawer fronts without tools in order to replace drawer fronts or to wipe out drawers.

**IV. Locks:** Removable lock plug system, nickel or black finish; furnish each lock with two (2) keys, keyed to space where casework is located, master keyed or sub master keyed upon request. Locks can be keyed alike or keyed different and can have master keys and sub master keys.

**V. Grommets:**

Provide wire and cable grommets to manufacturer's standard [white] or [black] plastic, 60 mm and/or [80 mm] diameter.

**VI. Wall Units/Cabinet Mounting Bracket and Attachment Rail:**

Concealed galvanized steel wall mounting bracket allowing vertical and front-to-back adjustment. Vertical alignment shall be ½ inch. Front-to-back adjustment shall be ¾ inch. Load bearing capacity to be 143 pounds per bracket with a minimum two (2) brackets per cabinet. Access to adjustment screws through 26mm diameter holes in back panel. Cover cap 26mm diameter black plastic. Cabinet Attachment Rail: galvanized steel, continuous strip 96 inches long.

**VII. Connecting Screws:**

Chrome-plated steel Sleeve Connector, with M4 internal thread and a combination head for Flat-blade, Phillips cross-slot driver and M4 fastening screw for joining separate carcass panels/cabinets.

**VIII. Brackets and Standards:**

White or black double-tracked 14 gauge steel uprights, wall mounted types; formed from single piece of 16 gauge steel without any upturn at end of bracket; dry mist epoxy polyester powder finish.

**IX. Heavy Duty Furniture Leveler:**

Adjustable leveler shall have a two-tier/sized hex base and with a load capacity of 500 pounds per leveler. Provide minimum of four (4) levelers per cabinet. Leveler shall adjust a full 1 ¾ inches using an Allen wrench. Levelers accessible through 16mm diameter hole in bottom of

cabinet.

**X. Casters:**

Casters shall have an overall height of 3, 4 or 5 inches. The caster housing shall be made of glass reinforced polyamide, have a double ball bearing swivel head, and a polypropylene wheel center with a polyurethane tread 30 mm wide. Caster color shall be RAL 7001 silver gray and each caster shall support 220 pounds. Each caster shall be fastened to the base by means of a 10mm socket head machine screw. The caster must roll easily over carpet and hard surfaces alike.

**3 EXECUTION**

**3.1 Site examination**

**3.1.1** The Owner and/or his representative shall assure all building conditions conducive to the installation of a finished goods product; all critical dimensions and conditions previously checked shall be adhered to by other contractors (general, mechanical, electrical, etc.) to assure a quality installation.

**3.1.2** All overhead work, including drop in ceilings, HVAC, and lighting shall be complete.

**3.1.3** Floor systems shall be installed and painting shall be completed before installation of casework system is to begin.

**3.2 Installation**

**3.2.1 Preparation**

Prior to beginning installation of casework, check and verify that no irregularities exist that would affect quality of execution of work specified.

**3.2.2 Coordination:**

Coordinate the work of the Section with the schedule and other requirements of other work being prepared in the area at the same time both with regard to mechanical and electrical connections to and in the fume hoods and the general construction work.

**3.3 Performance:**

**3.3.1 Casework:**

- Set casework components plumb, square, and straight with no distortion and securely anchor to building structure. Level as required.

- Bolt continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16" tolerance.
- Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8" between top units.

#### **3.3.2 Worksurfaces:**

- Where required due to field conditions, scribe to abutting surfaces.
- Only factory prepared field joints, located per approved shop drawings, shall be permitted. Secure the joints in the field, where practical, in the same manner as in the factory.
- Secure worksurfaces to casework and equipment components with materials and procedures recommended by the manufacturer.

#### **3.3.3 Adjust and Clean:**

- Repair or remove and replace defective work, as directed by Owner and/or his representative upon completion of installation.
- Adjust doors, drawers and other moving or operating parts to function smoothly.  
Clean shop finished casework; touch up as required.
- Clean worksurfaces and leave them free of all grease and streaks.
- Casework to be left broom clean and orderly.

**END OF SECTION**